US-China Water Management Conference
Agriculture and Forestry Breakout Group
April 20, 1999

Seven thousand years of continuous agricultural development have provided China with a rich base of experience and a deep respect for agriculture. In the U.S., agriculture is held in special regard, since farmers and ranchers have played an integral role in our nation's development. Through cooperative efforts, U.S. and Chinese scientists and policy makers have the opportunity to build on the history and experiences of thousands of years in combination with recent technological advances to the mutual benefit of both countries.

The breakout session on Agriculture and Forestry was held on April 20-21, 1999. It was co-chaired by Dr. Chen Shengdou, Department of Crop Production, the Chinese Ministry of Agriculture and Dr. Richard Affleck, Foreign Agriculture Service, USDA and Dr. Leonard Lane, Agricultural Research Service, USDA.The session included presentations on U.S. and Chinese experience and state of the art and science concerning soil erosion and sedimentation; water management and quality including irrigation and soil salinity; regional and watershed research and modeling; and improving water use efficiencies for food production. Both sides gained a better understanding of agriculture and water management problems and practices in both countries.

Soil and water conservation are high national priorities and sustainable agriculture depends on soil conservation. Erosion prediction tools are the backbone of the USDA's efforts to address soil erosion. Although simulation models developed in the US may not be applicable to Chinese conditions, the opportunity exists to modify and improve existing models for use in China. Technological needs include improved soil erosion assessment and prevention technologies applicable to Chinese conditions; improved tillage methods and equipment; database development for use in erosion prediction; and the use of remote sensing for data collection.

Water management and water quality discussions were directed toward irrigation management and systems and their associated impacts on water quality. Technological needs include developing optimal designs of irrigation and drainage systems to increase water use efficiency and to address the problem of salinity. Water quality monitoring strategies need to be developed. Technology is needed to address problems associated with the reuse of wastewater.

The experimental watershed program is the core of watershed simulation model development in the U.S. U.S. scientists have provided training and applied several watershed simulation models, including SWAT, in China. Further advance to simulation models, and the use of models in China requires the development of Chinese databases.

Technological needs include the computerization of existing data and the development, testing, and application of GIS based watershed models applicable to Chinese conditions.

Water use efficiency for food production can be increased through improvements to irrigation and dryland agriculture. Technological needs include methods to improve water use efficiency, machinery for protective tillage, improved seeds, and improved irrigation designs.

Through intensive discussion described above the group arrived at the following mutual understanding:

_ Agricultural water use in both the U. S. and China accounts for more than 70% of their respective water resources, and is a major sector of water resources management. Water shortage will, however, affect sustainable agriculture in both countries, and therefore water must be managed wisely
_ U.S. and China have common interests in water resource management in agriculture and forestry. The U.S. can transfer advanced theories and technology to Chinese agriculture to help prevent failures in the management of water resources.
_ Both sides understand that the key issue of water conservation in agricultural and forestry sectors is to improve water use efficiency. Therefore both sides have developed a number of advanced technologies in this area. The mutual exchange and transfer of these technologies will benefit both U.S. and China.

Based on mutual interests and discussions between Chinese and U.S. participants during the breakout sessions the following activities appear to be the most important means of advancing and improving the sustainability of agricultural practices in both nations. Areas for further collaboration (training courses, workshops, technology transfer and conferences) include:

_ Soil and water conservation technology
_ Irrigation management and irrigation systems including design and implementation
_ Regional watershed management for production and conservation
_ Dryland farming management and technology
_ Water harvesting methods
_ Watershed modeling technology including data sharing
_ Protective tillage practices
_ Forest conservation Practices
_ Water transfer
_ Improved seeds
- Research and extension systems

- Watershed monitoring and assessment